EMISSION OFFSET AVAILABILITY ISSUES

INTRODUCTION

Offsets are required for major sources in areas that are not in attainment with federal air quality standards, or for major new sources that may cause non-attainment. This paper focuses on the potential siting constraints that obtaining offsets may have for new power projects. This paper does not attempt to identify issues that relate to Title IV acid rain trading credits.

For purposes of comparison in this paper, a new power project is assumed to be a 500 to 550 MW facility comprised of two GE 7F, or equivalent turbines with duct firing and heat recovery. This represents a typical new facility proposal; however, facilities as large as 4 GE 7F turbines, or equivalent, with a generating capacity of as much as 1200 MW or more are also being proposed.

OFFSET REGULATIONS/REQUIREMENTS

Emission offsets are required for new major sources in order to obtain a net air quality benefit, so that these new major sources will not negatively affect the pollutant attainment goals for each air basin. Emission offsets are the amount of a pollutant that must reduced in order to obtain the goal of a net air quality benefit. Emission Reduction Credits (ERCs) are the verifiable historic emission reductions that can be used to offset a project's emissions. The process that regulates offsets and ERCs is the New Sources Review regulations.

NEW SOURCE REVIEW

The Federal Clean Air Act (CAA) requires that new major stationary sources of air pollution sited in districts designated as non-attainment obtain emission offsets. The CAA further requires new major stationary sources and major modifications to existing major stationary sources to obtain a construction permit before commencing construction. This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The non-attainment area NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and non-attainment NSR permit reviews, is referred to as the federal NSR program. The more severe the non-attainment status the lower the emission threshold for providing emission offsets[1].

The responsibility for controlling emissions from stationary sources of air pollution rests with California's local districts. The California Clean Air Act requires districts to adopt a NSR permitting program that results in no net increase in emissions from

[1] Federal and state area designation maps of various California air districts for different ambient air pollutants are available from the CARB website at http://www.arb.ca.gov/desig/adm/.

new and modified stationary sources which have the potential to emit over a specified amount of non-attainment pollutants or their precursors. As part of NSR, major stationary sources are required to apply the Best Available Control Technology (BACT), or Lowest Achievable Emission Rate (LAER) technology, to reduce emissions and, in some cases, to provide emission reduction offsets to mitigate the impact of emissions from the source remaining after the application of BACT. Offsets must meet certain criteria: the emission reductions must be real, permanent, surplus to any federal, state or local laws or regulations, quantifiable and enforceable.

OFFSET TRIGGERS

The attainment status and the designated level of non-attainment determine the offset trigger levels required by each local district. There are both state and federal pollutant standards and local districts in California may be in attainment of federal standards but in non-attainment of state standards for the same pollutant. For example, the state ozone standard is more restrictive than the federal standard; therefore many more districts are designated non-attainment for the state ozone standard. The state CAA requires that these districts prepare plans to reach attainment of the state ozone standard at the "earliest practical date". These plans typically include rule requirements for offsets of nitrogen oxides (NOx) and volatile organic compounds (VOC) for new sources and modifications to existing sources. Table 1 presents a comparison of NOx and VOC offset thresholds based on federal and state regulations. It also includes the districts that fall under different designation categories per federal and state standards.

Even though the designations shown in Tables 1 may be the same (moderate, serious, severe and extreme), the means by which the U.S. Environmental Protection Agency (EPA) and the state Air Resources Board (ARB) determine a designation are somewhat different. The state ozone standard is lower (0.09 parts per million (ppm) versus the federal 0.12 ppm) so that the ranges of the ambient ozone design levels to determine the designations are different. In addition, the ARB considers the effect of transport of pollutants from one district to a contiguous district in determining the designation. Transport of pollutants was a significant consideration in the designation levels for Kern County Desert, Mojave Desert, San Diego and Ventura Districts.

EMISSION BANKING

Emission banking is the process by which emission reduction credits (ERCs) are created. Emission reductions that are quantifiable, enforceable and permanent can be banked as ERCs. These emission reductions must be surplus; that is, reductions that occur after implementation of emission reductions are required under state or district regulations (i.e. included in the State Implementation Plan (SIP)). The banking of ERCs is generally similar to the permitting process, where an application is submitted and reviewed, the preliminary and final decisions are sent for public notice and after resolution of any comments the ERCs are granted. The trading of ERCs also requires district approval, but trading generally requires a less formal process than the initial banking of ERCs.

Table 1: Federal and State District Ozone Designation

Non-attainment Designation	District (per Federal Designation)	Federal NOx and VOC Offset Triggers (tons/year)	District (per Federal Designation)	State NOx and VOC Offset Triggers (tons/year)
Transitional	Imperial	100	Nevada, Placer, El Dorado, Amador, Calaveras, Tuolumne, Mono, Mariposa	
Moderate	San Francisco Bay Area	100	Shasta, Tehama, Colusa, Glenn, Butte, Sutter, San Benito, Santa Cruz, Monterey Bay Unified, San Luis Obispo, Santa Barbara, Kern County Desert, Mojave Desert, Imperial, San Bernardino	25
Serious	Santa Barbara San Diego San Joaquin Valley	50	Bay Area San Diego Broader Sacramento	15
Severe	Broader Sacramento[2] Ventura Southeast Desert Modified[3]	25	San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, Kern, Ventura	10
Extreme	South Coast	10	South Coast	4

OFFSET STRATEGIES

To allow for more flexibility and opportunity for project permitting, many districts allow the use of various offset strategies. These offset strategies include inter-district offsetting, inter-basin offsetting, inter-pollutant offsetting, or inter-sector offsetting. Each of these trading methods involve “trading ratios” to account for the effect of various trading strategies. These trading ratios may be used in addition to the normal offset ratio applied to pollutant ERCs.

INTER-DISTRICT/BASIN OFFSETS

Inter-district offsetting is allowed per California Health and Safety Code Section 40709.6, as long as the neighboring district is in the same air basin. Offsetting emissions between air basins is also allowed under Section 40709.6, with two conditions. Such offsets can be used only from an "up wind" neighboring district with a worse non-attainment status; the downwind district must be determined by ARB to be overwhelmingly impacted by pollution from the upwind district. An example would be the Mojave Desert Air Quality Management District, located in the Southeast Desert Air Basin, which allows the use of offsets located in the South Coast Air Quality Management District, which is in the South Coast Air Basin. Table 2 shows which districts can use emission reductions from neighboring districts in different air basins that meet the two criteria discussed above.

[2] Broader Sacramento includes all of Sacramento and Yolo Counties, the eastern portion of Solano County, the southern portion of Sutter County, and all of Placer and El Dorado Counties except the Lake Tahoe Basin.

[3] Southeast Desert includes central part of Riverside, part of east Los Angeles, and part of San Bernardino.

Table 2: Inter-Basin District Trading

Districts which can be used for inter-Basin offsets	Districts which can use inter-Basin offsets from other Air Basins
Broader Sacramento Area[4]	Calaveras, Amador, El Dorado, Placer, N. Sierra, Colusa, Feather River, Glenn, Butte, Tehama, Shasta
San Joaquin Valley	Amador, Calaveras, Tuolumne, Mariposa, Great Basin, Kern Desert, Mojave Desert
Bay Area	Monterey
South Coast	San Diego, Mojave Desert, Imperial

INTER-POLLUTANT TRADING

Inter-pollutant trading is the practice of allowing the use of emissions of one pollutant for offsetting another pollutant. The most common type of inter-pollutant trading is the allowance of VOC credits for NOx emissions, since they both contribute to ozone formation. Another inter-pollutant trading option is the use of NOx and sulfur dioxide (SO2) emission reduction credits for a particulate (PM10)emissions liability. Both NOx and SO2 are converted to PM10 in the atmosphere. The use of VOC emission credits for a PM10 emissions liability are also occasionally allowed.

The offset ratios required for inter-pollutants ERCs can be significantly higher than the offset direct offset ratios required for same pollutant ERCs. Therefore, the use of inter-pollutant ERCs can reduce banked ERCs at a higher rate than would occur if same pollutant offsets could be procured.

INTER-SECTOR TRADING

Inter-sector trading is a concept that involves a stationary source, such as a power plant, being offset by reductions from area sources, such as agricultural burning, water heaters, or road paving; or from mobile sources. Mobile source emission reduction credits (MERCs) can be created by the removal of old vehicles from operation; the replacement of fleet vehicles, such as buses and commercial truck fleets, with models cleaner than required to meet emissions standards; or retrofitting passenger cars or on-road vehicles to reduce emission. The major issue regarding the creation of these inter-sector ERCs is maintaining the requirement that the emission reductions be both quantifiable and enforceable.

OFFSET RATIOS

Offset ratios are often set by the distance of the offset source to the new source being offset. Other emission offset ratios have been created for both inter-pollutant trading and inter-basin trading. Offset ratios can vary from 1 to 1 to over 4 to 1 depending on the offset scenario.

[4] The Broader Sacramento Area includes the Sacramento Metropolitan Air Quality Management District, the Yolo-Solano Air Pollution Control District, the southern one-third of the Sutter County Air Pollution Control District, and the western portions of the El Dorado and Placer County Air Pollution Control Districts.

EMISSION REDUCTION CREDIT SOURCES

INTERNAL CREDITS

Internal credits are only available to existing sources of air pollution, primarily permitted sources. Specifically, any existing source of pollution, such as an existing power plant, can reduce current emission levels and use those reductions to offset new projects. Generally, internal emission reduction credits can be used at a lower offset ratio than ERCs from other locations, often at a 1 to 1 ratio. For the purposes of siting large power plants, only existing major sources would have a large enough emission profile to offset a new project. Therefore, a source of offsets for a new power project could come from the re-powering of an existing power plant, particularly one that has a higher emission profile than can now be met with the application of current BACT/LAER technologies.

DISTRICT OFFSET BANKS/FREE MARKET TRADING

Each District that requires offsets for new projects maintains an offset bank. The credits in these banks are available for free market trading. The procurement of emission reduction credits does not have to be tied to a proposed source of emission, which allows for speculative trading and accumulation of credits.

The cost of traditional banked ERCs, particularly in Southern California, have been on the rise. Costs for NOx ERCs are now routinely exceeding SCAQMD's maximum target level of $15,000/ton, and NOx offsets in San Diego County have exceeded $40,000/ton. The documented costs for obtaining ERCs in 1999 are listed in Table 3.

Table 3
1999 Offset Costs
$/Ton

	NOx	HC	PM10	CO	SO2
Average	$13,884	$6,579	$10,400	$3,033	$4,864
Median	$10,925	$4,931	$11,111	$3,333	$5,100
High	$45,000	$28,334	$16,800	$8,015	$9,200
Low	$913	$913	$500	$278	$913

Source – CARB 2000, Emission Reduction Offset Transaction Cost Summary Report for 1999.

The costs for ERCs have increased since 1999 and a typical new power plant (500 to 550 MW plant) could have to spend as much as $6,000,000, or more, to offset the typical annual emissions for all five of the listed criteria pollutants.

EMISSION REDUCTION CREDIT AVAILABILITY

Emission Reduction Credits are readily available for certain pollutants in certain air basins and almost non-existent to completely nonexistent for certain pollutants in certain air basins. Generally, air basins with a historically high count of large industrial air pollution sources (i.e. major sources) have more existing emission reduction credits available than areas that had less historical development. Since

emission reduction credits have to be obtained through the reduction of pollution, it is no accident that areas that have few historical air pollution sources also have little or no available emission reduction credits.

Certain air basins do not have sufficient existing ERCs to offset a single new power plant. Other air basins have sufficient offsets for some pollutants but not for others. Table 3 identifies existing ERCs for four major air basins/districts, along with a comparison of the emissions from a typical new power project[5].

Table 4
ERC Availability and 550 MW Power Project Emissions (Tons)

District	NOx	VOC	PM10	SO2	CO
BAAQMD	2,475	3,071	432	1,570	1,609
SCAQMD	1,098	21,099	1,143	608	4,061
SDCAPCD	122	218	--	--	--
SJVAPCD	9,077	7,989	1,269	4,253	26,410
550 MW Project	**150**	**50**	**100**	**40**	**300**

As illustrated in Table 4 there is a limited amount of ERCs available for selected pollutants in each of these four major air basins/districts. While there do appear to be enough ERCs available for several large power projects, the fact that ERCs exist do not mean that those ERCs are for sale. In general, the ERC availabilities listed above appear to be inadequate considering the new power generation that is needed within the next few years.

While a review of the existing ERC bank for each air district identifies the potential for existing offsets, there is no requirement that ERC holders sell their ERCs, so the amount of ERCs that are available may be significantly less than the amount of ERCs that are listed in the bank records. Additionally, certain credits listed in the bank records may have limited applicability, such as only being allowed to be used at the source where the credit was obtained.

CASE HISTORIES

Following the restructuring of electricity generation industry in March 1998, the California Energy Commission received a number of applications for licensing new power plants. Since April 1999, CEC has approved nine major power plant projects with a combined generation capacity of 6,278 megawatts. Six power plants, with a generation capacity of 4,308 megawatts are now under construction, with 2,368 megawatts expected to be on-line by the end of the year 2001. In addition, another 14 electricity generating projects, totaling 6,734 megawatts of generation and an estimated capital investment of more than $4.3 billion, are currently being considered for licensing by the Commission.

[5] The typical new power project is assumed to have BACT emission levels of 2.5 ppm NOx, 6.0 ppm CO, and 2 ppm VOC referenced to 15% O2.

The proposed projects are located throughout the State, with a majority of them located in three Air Districts: Bay Area, San Joaquin Valley and South Coast.

BAY AREA PROJECTS

Applicants for power plant projects in the Bay Area generally have been able to provide ERCs required to mitigate the facility's potential emission increases from the existing ERCs banked within the Bay Area Air Basin. An offset ratio of 1.15:1 has been used for the recent power projects permitted within the Bay Area.

In most cases, sufficient banked ERCs have been available to offset VOC emissions. Inter-pollutant trading of ERCs was used in some cases as part of the offset strategy. For example VOC ERCs have been used to offset NOx emissions. Both VOCs and NOx are precursors to the formation of ozone in the atmosphere. The premise of inter-pollutant trading is based on "inter-precursor offsets", which are limited to those pollutants that are precursors to the same secondary pollutant. The BAAQMD's New Source Review Rules allow for such trading. However, based on the pollutant exchange and the distance of the banked ERCs from the emission source, the trading ratios vary. These ratios are determined by the BAAQMD rules. The inter-pollutant trading ratios used for the projects in the Bay Area include: VOC for PM10 at a 2:1ratio, and SOx for PM10 at a 3:1 or 4:1 ratio.

SAN JOAQUIN VALLEY PROJECTS

The San Joaquin Valley Unified Air Pollution Control District is one of the largest air districts in the state, stretching from San Joaquin County to Kern County. The District's offsetting rules allow that ERCs may be used from anywhere within the District to offset new emission sources located anywhere within the District. ERCs obtained from sources less than 15 miles from the project would be discounted by a distance ratio of 1.2:1, while sources further away (greater than 15 miles) would be discounted by 1.5:1. This district keeps banked ERCs totals by the quarter of the year, and requires that emission offsets be provided based on the quarterly emission profile of the new major source. This has been done primarily due to the significant seasonal influence of agricultural related emission sources in the central valley. This allows the District to maintain emission reductions during periods of the year that they are most necessary in order to meet attainment goals.

The inter-pollutant trading used by the projects in this air basin includes the use of NOx ERCs to offset the PM10 emissions. A NOx to PM10 ratio of 2.22:1 is determined by the District to be the appropriate inter-pollutant trading ratio (Rule 4.2.5.3). This ratio has been adopted as an appropriate mitigation measure based on the relationship of NOx contributing to secondary PM10 formation of ammonium nitrate, especially during the high ambient PM10 winter season.

MOJAVE DESERT PROJECTS

For the projects within this air basin, the banked emission credits are very limited. Therefore the ERCs required to offset the emission increases need to be purchased mainly from other air basins. Although State and Federal laws allow the use of emission reductions from an upwind air basin to offset emission increases from sources in another air basin; however, these laws do not specifically identify the

appropriate offset ratios to use to ensure the effectiveness of the mitigation measures. District Rule 1305 “Emission Offsets” specifies an inter-basin offset trading ratio of 1.3 pounds of ERC for each pound of new emissions from a proposed facility. Although this ratio is not supported by a technical analysis, the rule has been approved by EPA. The inter-pollutant offset ratio used for the projects in this area is 1.6:1.

The projects in this air basin have combined the purchase of banked ERCs with other methods of providing obtaining emission reductions to offset project emissions. For example the Applicant of the High Desert Power Plant Project (approved on May 3, 2000), proposed to purchase part of the required PM10 emission reduction credits from the City of Adelanto by paving of unpaved roads and thus creating reduction in PM10 emissions in the area. District Rule 403-2(C)(4) requires that the Cities, Towns, and the County of San Bernardino shall collectively stabilize sufficient heavily traveled unpaved roads to reduce at least 1541 TPY of PM10 emissions within the District. Therefore, this type of proposed emission reductions can only be qualified as ERC if they are not part of the required reductions, but are surplus to them. This type of offset was used on a 1:1 ratio for PM10 emissions.

SOUTH COAST PROJECTS

Due to the severity of non-attainment in the South Coast Air Basin (SCAB), even minor sources of air pollution are required to offset their emissions. The emission increases shall be offset by either ERCs or allocations from the Priority Reserve. Offset ratio for ERCs is 1.2:1. Inter-pollutant trading is practiced in many cases. Trading ratios for VOC for PM10 of 3:1 and SO2 for PM10 of 2:1 have been used for the projects in the SCAB.

On October 15, 1993, the South Coast Air Quality Management District adopted a Regional Clean Air Incentives Market (RECLAIM), a new approach to market trading approach to reducing NOx emissions in the South Coast Air Basin. This program also use the trading credits to offset new project NOx emissions. South Coast is consider removing powerplants from the RECLAIM program. See the discussion below on page 11 regarding these changes.

SAN DIEGO PROJECTS

Offsets and air quality mitigation are difficult to procure in the San Diego Air Basin (see Table 3 above). The ERC market in San Diego Air Basin is limited and prices are high. Therefore, Applicants of new projects often need to combine traditional and non-traditional ways to secure ERCs to offset project emissions. For example, for NOx emissions it has been proposed to offset emissions by a combination of available banked ERCs and mobile emission reduction credits (MERCs). MERCs used by the projects in this area include replacement or retrofitting of existing diesel engines of vehicles (including marine vessels) with new, low emission (e.g., natural gas powered) engines. The difference in the NOx emissions from the existing and the new engines, multiplied by use factors, will be the amount of NOx reductions banked. PM10 emissions have been proposed to be mitigated using a combined

effort of road paving and diesel particulate reductions from buses, waste removal trucks and marine vessels.

The primary pollutant offset ratio is 1.2:1. The VOC to NOx ERC inter-pollutant trading ratio is 2:1, and the VOC to PM10 ERC trading ratio is 1:1.

OFFSET ISSUES FOR DISCUSSION

REGIONAL OFFSET AVAILABILITY

There are air basins that cannot currently site a new large power project without the creation of new ERCs. However, offsets are not required in other areas of the state and offset triggers are relatively high in many areas of the state, which would allow small or medium sized power project to be sited without the need for emission offsets. Additionally, ERCs are relatively plentiful in a small number of Air Basins. The plant siting process, considering other siting constraints, should identify those areas where new power projects can be proposed where offsets will not be a significant constraint, and identify those areas where new power projects are needed regardless of the status of available ERCs in order to focus on the creation of emission reductions/ERCs in these critical regions.

ERC COST

The cost of ERCs are increasing as the availability of ERCs are decreasing. Methods that could stabilize ERC costs could include: 1) government regulated maximum price caps; 2) government funding for ERC development (i.e. tax credits, direct control technology grants, direct funding of MERC programs, etc.); 3) banking provisions to discourage ERC speculative accumulation and hoarding; and 4) revising the California offset trigger limits (i.e. use federal trigger levels).

POTENTIAL SOURCES FOR EMISSION REDUCTION CREDITS

There are several sources for the creation of new emission reduction credits. Some of these include:

CONTROLLING EXISTING STATIONARY SOURCES

Controlling existing stationary sources would require a potential power plant proponent to install control equipment on an existing stationary source to reduce emissions and create ERCs. This method of creating ERCs is not useful in areas that do not have major stationary sources that have the potential for emission reductions through the use of add-on control technology.

MOBILE SOURCE EMISSION REDUCTIONS

Mobile source emission reductions are generally obtained through the replacement of older high polluting vehicles with newer lower polluting vehicles. Other potential sources of mobile source emission reductions could be through the funding of traffic improvement projects.

AGRICULTURAL EMISSION REDUCTIONS

Agricultural emission reductions can be obtained by collecting and disposing of biomass waste that would have been burned in the field. Additionally, as noted below, fugitive dust emission reductions, and perhaps VOC emission reductions are possible through additional control/reduction of field burning and pesticide/herbicide application.

MILITARY BASE CLOSURES

There have been a number of military base closures throughout California, and more closures are scheduled. Some of the bases undergoing closure had significant historic stationary and mobile emissions, which if properly documented may be able to provide a large amount of ERCs. Specifically, closed or closing air bases (Marine, Air Force, etc.) and major port facilities may be best target for obtaining new ERCs. However, the quantification of historic base emissions, particularly mobile source emissions may be difficult. Additionally, base reuse policies and the movement of closed activities to other bases within an air basin may render potential ERCs unavailable.

FUGITIVE DUST REDUCTIONS

PM10 ERCs are often the most limited type of ERC; therefore, developing new PM10 ERCs should be a priority. Fugitive dust ERC reductions have historically been obtained through road paving. Controlling fugitive dust releases from agricultural operations (i.e. tilling, pesticide/herbicide application, etc.) is also a potential source of new PM10 ERCs.

ENERGY EFFICIENCY STANDARDS

Energy efficiency and load management measures will reduce peak load requirements of the system. Since efficiency measures will reduce generation, they will also reduce the air emissions that would have otherwise occurred with these measures. This may be a potential source of ERCs, provided the reductions obtained can met Federal and State Clean Air Act requirements.

NEW POLLUTANT STANDARDS

The advent of new pollutant standards, namely the delayed federal PM2.5 standard, may have a beneficial or harmful affect on the need for offsets or on the amount of available emission reduction credits. If areas that are now in non-attainment for the PM10 standard are found to be in attainment for the new PM2.5 standard then new major sources may not have to obtain offsets for particulate emissions. Conversely, areas that are deemed in non-attainment of this new standard may have the amount of available particulate ERCs reduced due to a recalculation of the emission reduction from PM10 to PM2.5 emissions.

Under the Children's Environmental Health Protection Act (SB25), the Air Resources Board (ARB) and the Office of Environmental Health Hazard Assessment (OEHHA) are required to assess the adequacy of current health-based ambient air quality standards to determine whether the standards adequately protect the public, including infants and children, with an adequate margin of safety.

Health effects may occur in infants, children, and other potentially susceptible subgroups exposed to pollutants at or near levels corresponding to several existing California ambient air quality standards.

In December, 2000, the ARB approved the review of pollutants in two tiers, the first representing greater potential risks to public health at the concentrations of the current air quality standards. The first tier includes PM10, ozone, and NOx, with the recommended review priority in that order. The PM10 standard will be reviewed no later than December 21, 2002, and the remaining first tier standards would be reviewed at the rate of one per year starting in 2003.

FREE MARKET TRADING/CREDIT HOARDING

Free market emission reduction credit trading makes ERCs a speculative commodity. While offset cost need to be in line with the cost of creating the emission reductions, there is also the potential for offset costs to be inflated due to speculative trading. Additionally, ERC holders are not required to sell their credits and can essentially obtain and hoard credits, which limits the number of credits that are actually in the market.

CHANGES TO SOUTH COAST RECLAIM REGULATIONS

On October 15, 1993, the Governing Board adopted a new approach to reduce NOx emissions in the South Coast Air Basin by approving the Regional Clean Air Incentives Market (RECLAIM) program. It was expected that the program would provide additional incentives for industry to reduce emissions and develop better pollution control technologies. In addition, the program was designed to give facilities added flexibility in meeting emission reduction requirements. The program was design to reduce NOx emissions from 105 tons per day to 27 tons per day, at a lesser cost than the equivalent emissions under command-and-control rules.

Beginning June 2000, RECLAIM program participants experienced a sharp and sudden increase in NOx RECLAIM Trading Credit (RTC) prices for both 1999 and 2000 compliance years. The average price of 1999 NOx RTCs traded in 2000 was $15,377 per ton, which was almost ten times higher than the average price of $1,827 per ton of NOx RTCs traded in 1999 for the same compliance year. More significantly, the average price of NOx RTCs for compliance year 2000, traded in the year 2000 increased sharply to over $45,000 per ton compared to the average price of $4,284 per ton traded in 1999.

One factor that appears to contribute significantly to the price increase is the high demand for NOx RTCs from the utility sector during the year 2000. During this period the utility sector purchased 60 percent of NOx RTCs which expired in June 2000 and 67 percent of NOx RTCs expiring in December 2000. Such high demand from the utility sector quickly depleted the supply of available NOx RTCs in the market, resulting in the sharp increase in the NOx RTC prices.

AQMD's Governing Board gave preliminary approval to five initiatives January 19, 20001 to modify RECLAIM, the region's emissions trading market, to help stabilize RECLAIM credit prices and reduce the cost of compliance for industry while still

achieving air quality reductions. The action is expected to remove the influence of power plants' demand on the RECLAIM program while assuring adequate power supply.

AQMD staff presented the initiatives to the Board in a 60-page white paper. They are:

1. Adopt new or modified AQMD rules that:
   a. Separate major power plants from the rest of RECLAIM companies through 2003 and require them to install air pollution control equipment on an expedited schedule;
   b. Create a pilot RECLAIM Air Quality Investment Program through 2003 where certain companies could obtain additional NOx credits by paying $7.50 per pound of credits into the program. AQMD would use the funds to obtain equivalent emissions reductions;
2. Pre-fund the RECLAIM Air Quality Investment Program with a loan;
3. Continue to seek abatement orders for companies that have exceeded their RECLAIM allocations, imposing appropriate penalties and requiring expedited installation of pollution control equipment;
4. Initiate outside peer review of changes to the RECLAIM market structure; and
5. Convene a RECLAIM Rule Development Working Group.

QUANTIFIABLE, ENFORCEABLE, AND PERMANENT

By regulation, emission reductions must be quantifiable, enforceable and permanent in order to be banked as ERCs and used to offset emissions under NSR permitting requirements. Currently EPA has some questions regarding certain existing ERCs and may question new ERCs, particularly if those ERCs are generated using mobile sources, agricultural sources, or any other non-traditional source. If new ERCs generation does not meet the criteria of quantifiable, enforceable and permanent then the use of those ERCs could be subject to third party litigation.

ATTAINMENT STATUS

Changes to an area's attainment status will change the trigger levels for offsets. These trigger level changes can positively affect or negatively affect the offset market by requiring additional or fewer sources to obtain emission offsets. Currently, EPA's procedures for modifying attainment status are cumbersome and time consuming, particularly for revising attainment status from non-attainment to attainment or to a lower level of non-attainment.

CONTROL TECHNOLOGY/PROJECT SIZE EMISSION REDUCTION

The use of more efficient control technologies can reduce the amount of offsets required for a new power project. This is also addressed in the permitting process by the application of BACT/LAER. The cost of using of a more expensive control technology, particularly one with a higher capital cost rather than a higher operating cost, can be partially funded by the reduced ERC cost. Additionally, smaller

projects may not trigger the need to offset emission in various air basins/districts, or can reduce the amount of ERCs required in areas that have limited ERC availability.